



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2011-1229; Directorate Identifier 2011-NM-132-AD]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for certain The Boeing Company Model DC-9-10, DC-9-20, DC-9-30, DC-9-40, and DC-9-50 series airplanes; and Model DC-9-81 (MD-81), DC-9-82 (MD-82), DC-9-83 (MD-83), DC-9-87 (MD-87), MD-88, and MD-90-30 airplanes, that are equipped with auxiliary fuel tanks. This proposed AD was prompted by fuel system reviews conducted by the manufacturer. This proposed AD would require adding design features to detect electrical faults, to detect a pump running in an empty fuel tank, and to ensure that a fuel pump's operation is not affected by certain conditions. We are proposing this AD to reduce the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

DATES: We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Serj Harutunian, Aerospace Engineer, Propulsion Branch, ANM-140L, FAA, Los Angeles Aircraft Certification Office (ACO), 3960 Paramount Boulevard, Lakewood, California 90712-4137; phone: 562-627-5254; fax: 562-627-5210; e-mail: serj.harutunian@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2011-1229; Directorate Identifier 2011-NM-132-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

Discussion

The FAA has examined the underlying safety issues involved in fuel tank explosions on several large transport airplanes, including the adequacy of existing regulations, the service history of airplanes subject to those regulations, and existing maintenance practices for fuel tank systems. As a result of those findings, we issued a regulation titled “Transport Airplane Fuel Tank System Design Review, Flammability Reduction and Maintenance and Inspection Requirements” (66 FR 23086, May 7, 2001). In addition to new airworthiness standards for transport airplanes and new maintenance requirements, this rule included Special Federal Aviation Regulation No. 88 (“SFAR 88,” Amendment 21-78, and subsequent Amendments 21-82 and 21-83).

Among other actions, SFAR 88 requires certain type design (i.e., type certificate (TC) and supplemental type certificate (STC)) holders to substantiate that their fuel tank systems can prevent ignition sources in the fuel tanks. This requirement applies to type design holders for large turbine-powered transport airplanes and for subsequent modifications to those airplanes. It requires them to perform design reviews and to develop design changes and maintenance procedures if their designs do not meet the new fuel tank safety standards. As explained in the preamble to the rule, we intended to adopt airworthiness directives to mandate any changes found necessary to address unsafe conditions identified as a result of these reviews.

In evaluating these design reviews, we have established four criteria intended to define the unsafe conditions associated with fuel tank systems that require corrective actions. The percentage of operating time during which fuel tanks are exposed to

flammable conditions is one of these criteria. The other three criteria address the failure types under evaluation: single failures, single failures in combination with a latent condition(s), and in-service failure experience. For all four criteria, the evaluations included consideration of previous actions taken that may mitigate the need for further action.

We have determined that the actions identified in this proposed AD are necessary to reduce the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

A fuel pump may cause an ignition source in a fuel tank when it has internal electrical faults, or when the pump overheats due to prolonged dry running in an empty fuel tank. Electrical faults inside fuel pumps may cause arcing and burn through the pump housing. Electrical arcs entering an empty fuel tank may cause the fuel vapors to ignite. If a pump is not shut off in a timely manner when the tank is emptied, the dry-running pump may cause excessive heat and become an ignition source inside the tank.

FAA's Findings

During the SFAR 88 safety assessment, it was determined that each electrically powered fuel pump installed in the center wing tank and/or auxiliary fuel tank must have a protective device installed to detect electrical faults, which can cause arcing and burn-through of the fuel pump housing. That same device must shut off the pump by automatically removing electrical power from the pump when such faults are detected. It was also determined that design features must be added to detect when a center wing tank or auxiliary tank is emptied such that each pump is manually or automatically shut off within 60 seconds after it is emptied. The design features must also preclude undetected running of a fuel pump in an empty tank, after the pump was commanded off manually or

automatically. The design features must also ensure that a fuel pump cannot be shut off due to system failures sooner than a specified length of time.

FAA's Determination

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD would prohibit operation of an affected airplane as of 60 months after the effective date of the AD, unless an amended type certificate or supplemental type certificate that incorporates the following design features and requirements has been approved by the FAA, and those design features are installed on the airplane.

- a protective device for each electrically powered fuel pump that will detect electrical faults and shut off the pump automatically when such faults are detected
- additional design features to detect any center wing tank or auxiliary fuel tank pump running in an empty fuel tank and to shut off each pump within a specified time
- means to ensure that a fuel pump cannot be shut off due to system failures sooner than a specified length of time.

This proposed AD would also prohibit operation of any airplane affected by this AD unless the FAA-approved design features specified in the certification plans are installed within a specified time.

Costs of Compliance

We estimate that this proposed AD affects 1,288 airplanes of U.S. registry. We estimate the following costs to comply with this proposed AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Installing design features - for airplanes with center wing and auxiliary tanks (600 airplanes)	50 work-hours X \$85 per hour = \$4,250	\$35,000	\$39,250	\$23,550,000
Installing design features - for airplanes with center wing tank (688 airplanes)	35 work-hours X \$85 per hour = \$2,975	\$17,000	\$19,975	\$13,742,800

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States,

or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by Reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

The Boeing Company: Docket No. FAA-2011-1229; Directorate Identifier 2011-NM-132-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company airplanes, certificated in any category, as identified in paragraphs (c)(1) through (c)(8) of this AD, and equipped with auxiliary fuel tanks.

(1) Model DC-9-11, DC-9-12, DC-9-13, DC-9-14, DC-9-15, and DC-9-15F airplanes.

(2) Model DC-9-21 airplanes.

(3) Model DC-9-31, DC-9-32, DC-9-32 (VC-9C), DC-9-32F, DC-9-33F, DC-9-34, DC-9-34F, and DC-9-32F (C-9A, C-9B) airplanes.

(4) Model DC-9-41 airplanes.

(5) Model DC-9-51 airplanes.

(6) Model DC-9-81 (MD-81), DC-9-82 (MD-82), DC-9-83 (MD-83), and DC-9-87 (MD-87) airplanes.

(7) Model MD-88 airplanes.

(8) Model MD-90-30 airplanes.

(d) Subject

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 28: Fuel.

(e) Unsafe Condition

This AD was prompted by fuel system reviews conducted by the manufacturer. We are issuing this AD to reduce the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Criteria for Operation

As of 60 months after the effective date of this AD, no person may operate any airplane affected by this AD unless an amended type certificate or supplemental type certificate that incorporates the design features and requirements described in paragraphs (g)(1), (g)(2), and (g)(3) of this AD has been approved by the Manager, Los Angeles Aircraft Certification Office (ACO), FAA, and those design features are installed on the airplane.

(1) Each electrically powered fuel pump installed in the center wing tank or auxiliary fuel tank must have a protective device installed to detect electrical faults that can cause arcing and burn through the fuel pump housing. The same device must shut off the pump by automatically removing electrical power from the pump when such faults are detected. When a fuel pump is shut off as the result of detection of an electrical fault, the device must stay latched off until the fault is cleared through maintenance action and verified that the pump and the electrical power feed is safe for operation.

(2) Additional design features must be installed to detect when any center wing tank or auxiliary fuel tank pump is running in an empty fuel tank. The prospective pump shutoff system must shut off each pump no later than 60 seconds after the fuel tank is emptied. The pump shutoff system design must preclude undetected running of a fuel pump in an empty tank, after the pump was commanded off manually or automatically.

(3) The implementation of the design features defined in paragraphs (g)(1) and (g)(2) of this AD must ensure that a fuel pump cannot be shut off due to system failures including nuisance shutoffs sooner than 100,000 hours' mean time between failures (MTBF).

Note 1: After accomplishing the installation specified in paragraph (g) of this AD, maintenance and/or preventative maintenance under 14 CFR part 43 is permitted provided the maintenance does not result in changing the AD-mandated configuration (reference 14 CFR 39.7).

(h) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Los Angeles ACO, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in the Related Information section of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(i) Related Information

For more information about this AD, contact Serj Harutunian, Aerospace Engineer, Propulsion Branch, ANM-140L, FAA, Los Angeles ACO, 3960 Paramount Boulevard, Lakewood, California 90712-4137; phone: 562-627-5254; fax: 562-627-5210; e-mail: serj.harutunian@faa.gov.

Issued in Renton, Washington, on October 28, 2011.

Ali Bahrami,
Manager,

Transport Airplane Directorate,
Aircraft Certification Service.

[FR Doc. 2011-29303 Filed 11/10/2011 at 8:45 am; Publication Date: 11/14/2011]